HIGH-RESOLUTION INFRARED SPECTRA AND ANALYSES OF SiF_4

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Volcanoes reject large amounts of sulfur-containing gases in the atmosphere; these represent 10 to 15 % of the anthropogenic sulfur emissions. Thermodynamic considerations show that silicon tetrafluoride (SiF_4) should be a normal trace component of volcanic gases. Some studies report that the possible importance of SiF_4 had been neglected because of the problems of reporting HF and SiF_4 separately in conventional analyses. However, a better knowledge of spectroscopic parameters is needed for this molecule in order to derive accurate concentrations. This is why we undertook an extensive high-resolution study of its infrared absorption bands, including the fundamentals and several overtone and combinations. We present here a detailed analysis and modeling of the strongly absorbing ν_3 fundamental, for the there isotopplogues in natural abundance: $^{28}SiF_4$ (92.23 %), $^{29}SiF_4$ (4.67 %) and $^{30}SiF_4$ (3.10 %). Progresses in the analysis of the other bands will be outlined.